



THE INTEGRATED COUNTERMEASURE ASSESSMENT SYSTEM (ICAS)

Presented to

SCI-130 WORKGROUP

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INFRARED COUNTERMEASURES ASSESSMENT SYSTEM (ICAS)

- Most military aircraft have inadequate or no Missile Warning System.
 - Almost all US aircraft losses since Vietnam have been to MANPADS.
 - MANPADS are cheap, lethal, available and can obstruct US air superiority.
 - MANPADS are a principal weapon of terrorists.
 - Navy EW programs are developing systems to detect and counter threat missile seekers that operate in the infrared or optical bands.
- An open-air, closed loop T&E capability to evaluate IR warning & countermeasures, quantify end-game effectiveness, and evaluate installed, integrated systems in military aircraft is an urgent need.

INFRARED COUNTERMEASURES ASSESSMENT SYSTEM (ICAS)

The ability to evaluate installed EO/IR warning & countermeasures on military aircraft in realistic environments is not available today.

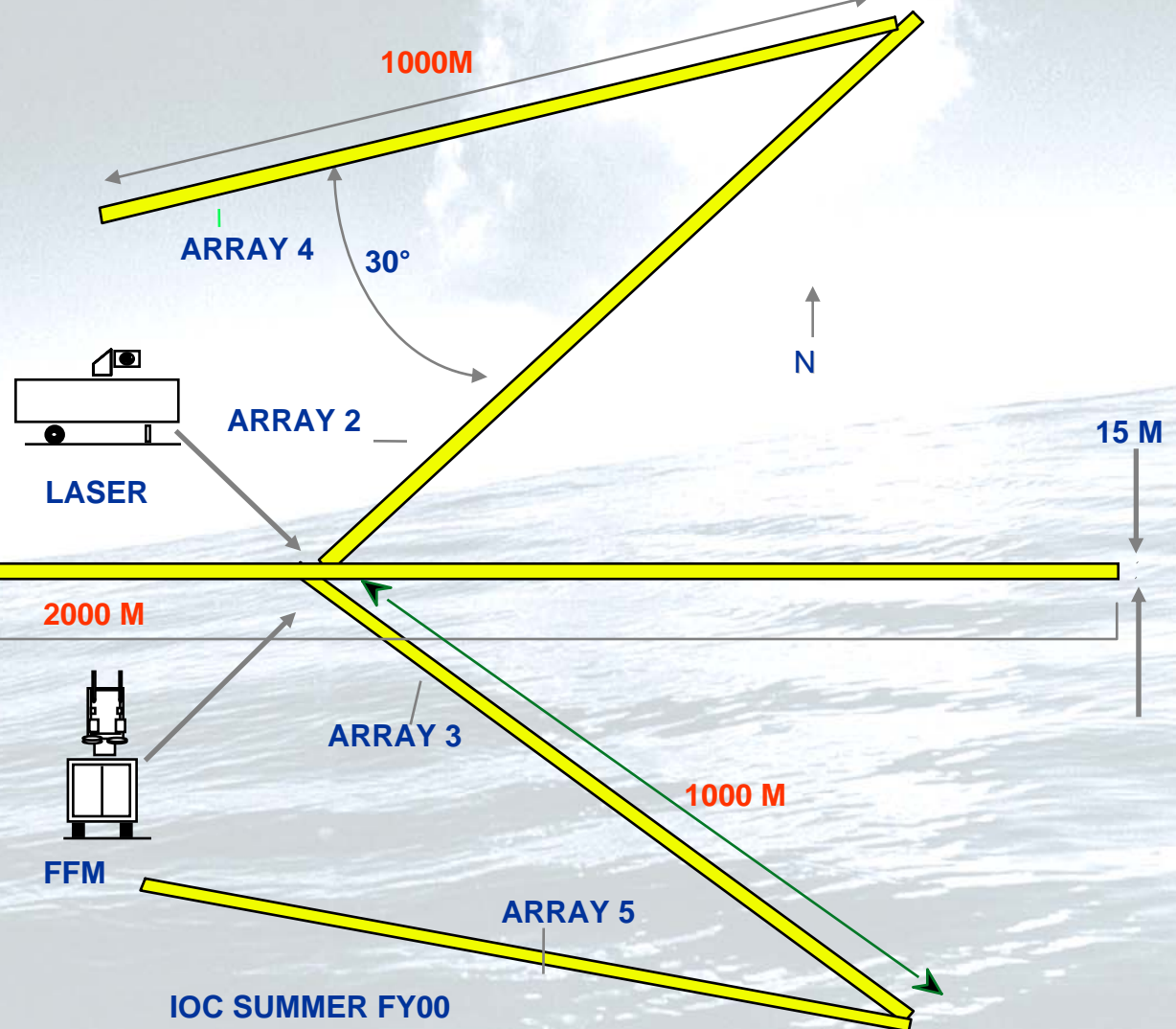
- T&E is conducted incrementally:
 - Hardware-in-the-Loop (HITL) simulations
 - Captive-Carry Seekers (examines Break-Lock only)
 - Open-Loop Static IR Seekers (Break-Lock)
 - Cable car live fire
 - Modeling and Simulation
- Installed systems are far more complex and interact with and/or depend upon many other avionic systems.

INFRARED COUNTERMEASURES ASSESSMENT SYSTEM (ICAS)

ICAS is responsive to this need!

- An open-air facility for installed testing and realistic flight behavior:
- IR and UV Plume Simulation (engages Missile Warning and DIRCM tracker)
- Uses IR seekers and guidance electronics
- Validated missile fly-out models & end-game dynamics (miss distance)
- Calibrated false alarm sources
- Real-time atmospheric & environmental effects
- Real-time IR scene to SPIL presentation (target, CM, environment)
- Precision TSPI & ground truth over a wide area

UV STIMULATOR ARRAY CONFIGURATION

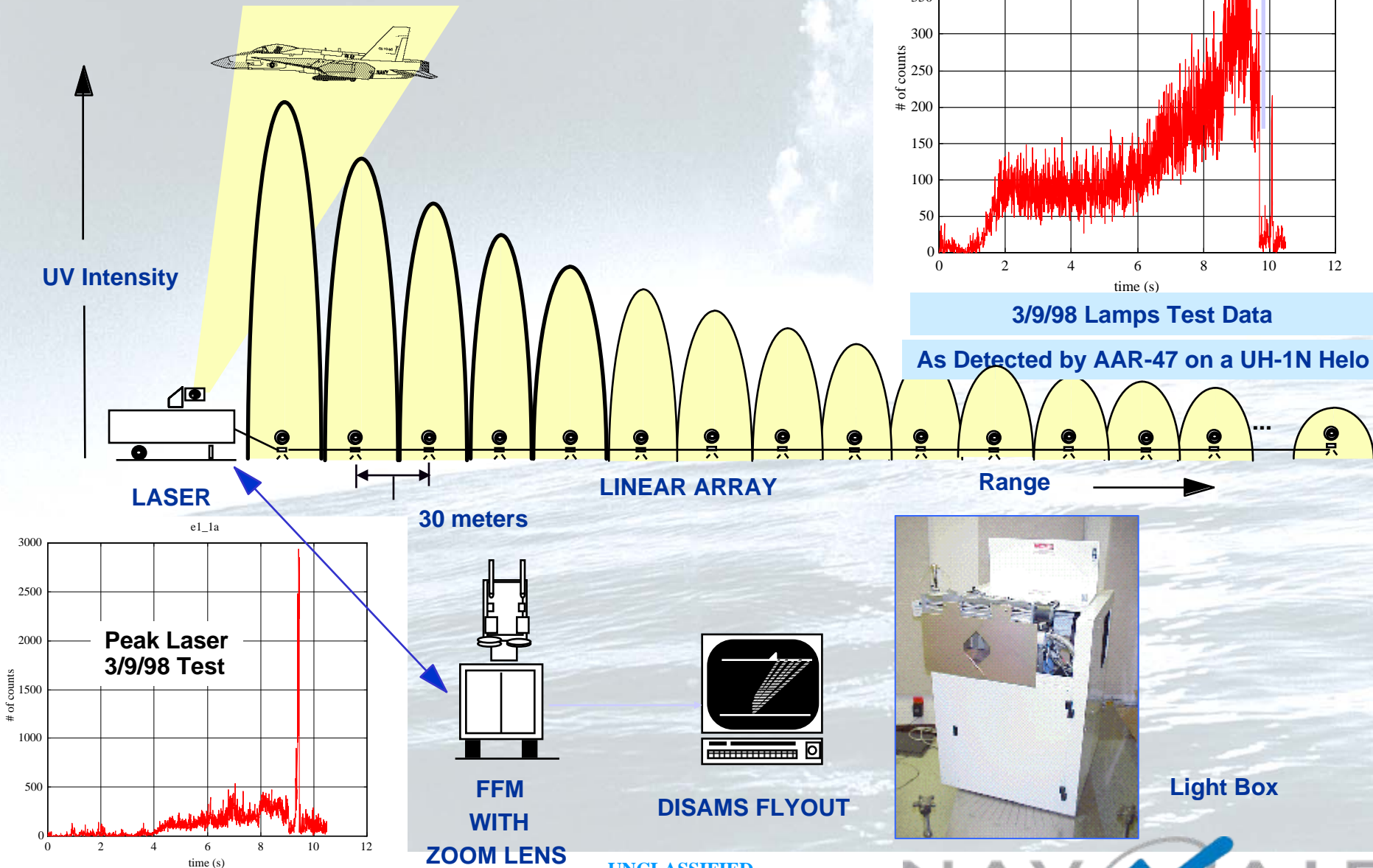


1. Each array will have 208 v 60hz, single phase power drops Spaced at 50 meter interval.
2. Lamps will be spaced at a Minimum of 30 meter interval.
3. Intersection of arrays 1,2, and 3 will contain uv laser and ffm Systems.

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UV STIMULATOR CONCEPT

MISSILE PLUME SIGNATURE SIMULATION



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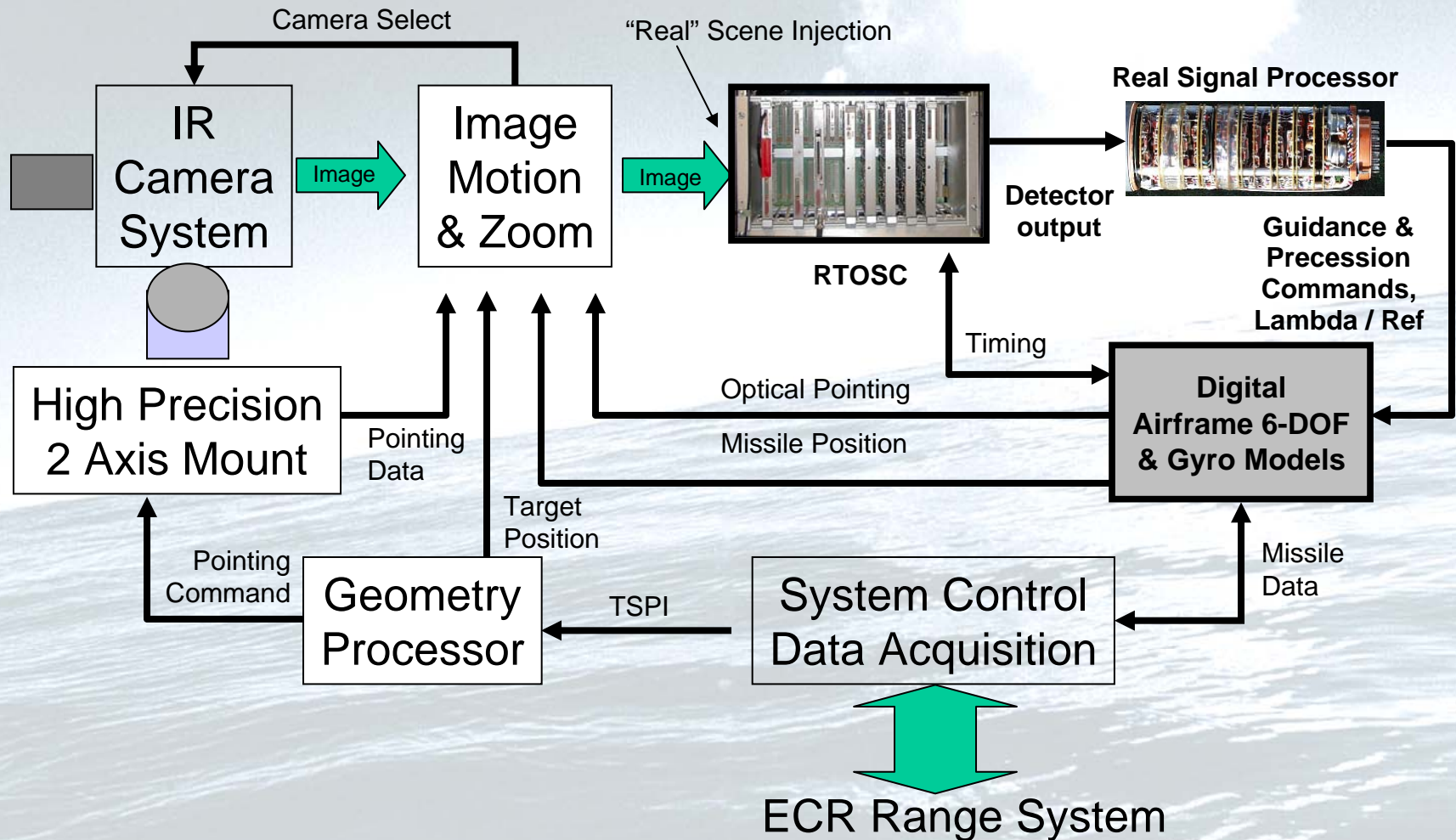


INFRARED COUNTERMEASURES ASSESSMENT SYSTEM (ICAS)

- **1 v 1 - 1 Aircraft versus 1 Threat (FY-03)**
 - UV Stimulator, Fire & Forget Missile (FFM), Zoom Optics, Fly-Out Model, Ozone Atmospheric
- **1 v 2 - 1 aircraft versus 2 threats (FY-04)**
 - Adds IR Stimulator, IR Target Array, & IR Atmospheric to 1 v 1
 - Closed-Loop ability to evaluate IR MWS & directed IR countermeasures
- **1 v Many - 1 aircraft versus many threats (FY-07)**
 - Additional seekers to FFM
 - Closed-Loop ability to evaluate end-game effectiveness for expendables and DIRCM countermeasures
- **Many v Many - Many aircraft versus many threats (FY-08/09)**
 - 1 v Many capability against 2 or more aircraft



CONCEPT FOR USE OF CONVOLVER



INFRARED COUNTERMEASURES ASSESSMENT SYSTEM (ICAS)

Conclusions

- T&E of installed IR warning and CM equipment requires an End-to-End approach and will dramatically improve with the availability of ICAS capabilities
- Evolutionary expansion of ICAS will produce a large range area in which developers and users can fly without significant constraints, conducting T&E, tactics assessment, mission rehearsal and unit training.
- As IR threat technology introduces multi-spectral, imaging seekers with powerful processing, ICAS will require enhancements but the fundamental facility concept can evolve to respond to any plausible future threat.

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